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10/729,482	12/04/2003	Yong Hwan Kwon	5882P066	3071

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EXAMINER

MOONEY, MICHAEL P

ART UNIT PAPER NUMBER

2883

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/729,482

Applicant(s)

KWON ET AL.

Examiner

Michael P. Mooney

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 10 and 11 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 12 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments/Remarks filed 10/17/05 have been fully considered but they are not persuasive.

At page 3 lines 4-7 of the 7/29/05 Non-Final Rejection (NFR), Examiner points out that the "radiused rib" is considered to be the "second waveguide" which is an isolated elevation having a flat top. This second waveguide (2<sup>nd</sup> WG) is depicted as the tapered waveguide mode converter 90 in Vawter et al. figure 9.

Claim 1 requires that the said 2<sup>nd</sup> WG is formed on the first (1<sup>st</sup>) waveguide (WG) for spot-size conversion. Furthermore, referring to Vawter et al. figure 9, it is shown that the 1<sup>st</sup> WG is the structure that is guiding the expanded mode wave 95. The 1<sup>st</sup> waveguide clearly has a ridge shape.

In the last paragraph of Applicant's 10/17/05 Remarks, Applicant states, "The Examiner *admits* that Vawter does not disclose the mesa structure..." [emphasis added]. The Examiner does **not** admit that "Vawter does not disclose the mesa structure...". On the contrary, Examiner is pointing out that Vawter et al. is using different wording to describe a mesa structure.

Additionally, Applicant states that Vawter et al. does not explicitly disclose that the mesa-type structure beneath the 2<sup>nd</sup>/rib waveguide 90 is a waveguide. The fact is that figure 9 shows the expanded mode wave 95 being guided by the mesa-type structure beneath the 2<sup>nd</sup>/rib waveguide 90. Therefore, the mesa-type structure beneath the 2<sup>nd</sup>/rib waveguide 90 is inherently a waveguide.

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Thus, from either of the 7/29/05 NFR or the above paragraphs it is clear that Applicant's statement "...Vawter can at most be characterized as teaching two waveguides having rounded transition at their junctions" is a false statement. Furthermore, contrary to another one of Applicant's statements, from either of the 7/29/05 NFR or the above paragraphs it is also clear that the radiused rib is related in some way to the shape at the start portion of the 2<sup>nd</sup> WG.

Moreover, contrary to the Applicant's statements, applying the concept of the radiused rib to the start portion of the rib waveguide clearly results in a mesa structure. It is noted that the criteria Examiner used in the 7/29/05 NFR for characterizing a "mesa" structure is consistent with accepted definitions of the word "mesa". Applying the concept of the radiused rib to the start portion of the rib waveguide results in a waveguide that is a "mesa" structure consistent with accepted definitions of the word "mesa". Therefore, applying the concept of the radiused rib to the start portion of the rib waveguide does not result in a structure where, in Applicant's words, "There will be no mesa...at the start portion..."

Thus the 7/29/05 NFR Office Action, contrary to Applicant's Remarks, shows that the cited reference(s) at least teaches or suggests each of the following elements as stated by Applicant: "a second waveguide formed on the first waveguide.....wherein the second waveguide has a taper shape having a width that is gradually widened in a direction along the waveguide at a start portion, and the start portion of the second waveguide has a mesa structure or a reverse-mesa structure."

Thus, Applicant's arguments are refuted.

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Additionally, *arguendo*, applying the concept of the radiused rib to the start portion of the rib waveguide is not even necessary to make the start portion of the rib waveguide into a mesa structure because *even without* the radiused rib, the rib waveguide is still a "mesa" structure consistent with accepted definitions of the word "mesa".

The 7/29/05 Office action is repeated below:

**DETAILED ACTION [7/29/05 Office Action]**

Applicant's election of claims 1-4, 10-13 in the reply filed on 5/11/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 1-2, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vawter et al. (6229947).**

Vawter et al. teaches spot size converter, comprising: a semiconductor substrate (fig. 9); a first waveguide (figs. 9, 9A) stacked on the semiconductor substrate in a ridge shape and provided for optical coupling with an optical fiber (Abstract, figs. 9, 9A); and a second waveguide (e.g., fig.9 #90) formed on the first waveguide for a spot size conversion, wherein the second waveguide has a taper shape having a width that is gradually widened in a direction along the waveguide at a start portion (e.g., fig.9 #90).

Although Vawter et al. does not expressly state that the start portion of the said second waveguide has a "mesa structure or a reverse-mesa structure", Vawter et al. does teach a "radiused rib" (fig. 8A; col. 6 lines 40-52) which is an isolated elevation having a flat top. A structure composing an isolated elevation having a flat top may reasonably be interpreted to be a mesa structure.

One of ordinary skill in the art at the time the invention was made would have been motivated to use Vawter et al.'s mesa/radiused-rib structure in a configuration such as at the start position of the tapered waveguide in Vawter et al.'s figure 9 in order to obtain higher coupling efficiency.

Thus claim 1 is rejected.

Vawter et al. teaches wherein the mesa/radiused-rib structure or the reverse-mesa structure has a width of below 1  $\mu\text{m}$  (middle portion in thickness), e.g. at col. 7 lines 25-32. Thus claim 2 is rejected.

By the reasons and references given above and notoriously well known principles in the art, each and every element of each of claims 10-11 are rendered obvious. Thus claims 10-11 are rejected.

***Allowable Subject Matter***

Claims 3-4, 12-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art, either alone or in combination, does not disclose or render obvious a the unique combination of each and every specific element stated in each of claims 3-4, 12-13. [End of 7/29/05 Office Action].

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

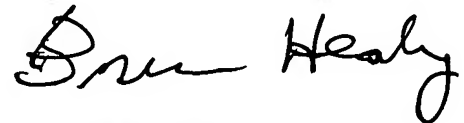
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.



Michael P. Mooney  
Examiner  
Art Unit 2883

Frank G. Font  
Supervisory Patent Examiner  
Art Unit 2883

FGF/mpm  
12/15/05



Brian Healy  
Primary Examiner